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## INTEGRATION OF ENVIRONMENTAL ETHICS EDUCATION IN THE CLASSROOM: A REVIEW OF LITERATURE

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**Abstract:**

Due to the catastrophic impact of global warming and various environmental challenges, ecological issues are a topic of discussion in every country. Researchers believe that solutions to environmental problems lie in integrating environmental ethics education in schools to create awareness of moral values and attitudes of humans toward the environment. However, more efforts must be made to integrate environmental ethics education into the school curriculum. This study, therefore, argues for the examined literature to find out how school teachers integrate environmental ethics education in lessons. The study adopted the qualitative systematic literature review method, and twenty-six peer-review articles were selected from the EBSCO, Scopus, and Google Scholar databases. The twenty-six selected peer-review articles were analyzed to determine the level of integration of environmental ethics education in South African classrooms. The study revealed that internalizing environmental ethics education as a moral foundation may make humans aware of their interaction with the environment. According to the literature, awareness of improved environmental ethics education assist humans in behaving and acting ethically toward nature, thereby contributing to reducing environmental damage and improving environmental conservation and management. The study suggests the organization of environmental, ethical awareness in-service training programs by the Department of Basic Education for teachers, exposing them and their learners to environmental ethics, disciplined behavior, and positive attitude toward their environment.

**Keywords:** Environmental awareness, environmental education, environmental ethics education, teaching and learning, integration.

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## INTRODUCTION

Debates on the emergence of environmental ethics as a new study area have generated many discussions worldwide. Environmental ethics have found their way into all disciplines since the advent of the industrial revolution Attfield (2014). Countries over the world have committed resources towards the attainment of the Industrial Revolution. This has transformed into the establishment of factories, railways, automobiles, and the promotion of policies that facilitate the establishment of factories that use fossil oil and emit carbon dioxide, which results in climate change and global warming (Shahbazi & Nasab, 2016; Sovacool et al., 2021). These activities have threatened human existence, health, and animals in the environment. It has also resulted in climate change and other environmental issues affecting our environment. According to Prakash & Verma (2022) and Crumley-Effinger & Torres-Olave (2021), anthropogenic climate change is a deliberate human activity detrimental to the environment.

Environmental education came into being through the intergovernmental conference 1970 aimed at addressing global warming (Gough, 2013). The 1972 Stockholm Convention led to the adoption and integration of environmental education into the school curriculum at all levels of education (UNESCO, 1972). Researchers in the field of environmental education have advocated the need to integrate environmental ethics into the school curriculum so that environmental and ethical issues will be part of the school curriculum that will guide the way we relate with our environment right from elementary schools (Gough, 2013; Liu et al., 2019). Paakkari and George (2018) opined that teachers' appropriate use of pedagogy and educational materials in teaching environmental education and environmental ethics would enhance learners' understanding of environmental ethics, thereby helping address environmental problems. However, more efforts must be made to integrate environmental ethics education into South African school curricula.

Furthermore, there needs to be more literature that focuses on how teachers integrate environmental ethics education into their lessons. Most studies (Mavuso et al., 2022; Monroe et al., 2019; Thenga et al., 2020). focus on climate change and implementing capacitation programs for teachers on environmental education. However, teaching a cultural curriculum based on indigenous peoples' beliefs and concern for nature may be critical to restoring local and international environmental sanity. It may also help to improve overall educational goals and objectives in nature or environmental studies (Kaya & Seleti, 2014).

Concerns for the environmental issue have been observed in South Africa immediately after the end of the apartheid era (Oladipupo et al., 2021). Through the South African constitution, the South African government advocated the need to protect the environment. The Council for Scientific and industrial research (2004), section 24, the constitution of South Africa provides for the protection of the people in their environment against abuse and to ensure that the environment is not harmful to the existence of South Africans. In compliance with these constitutional requirements, environmental education was incorporated into the school curriculum across subjects at both the GET and FET phase of the South African educational system (Schudel, 2014). The adoption of EE into the school curriculum is to create environmentally literate and responsible citizens that will uphold the protection of the environment. Even though the school curriculum recognizes environmental education, environmental ethics must be emphasized. Hence this study sought to investigate how South African teachers integrate environmental education into their lessons in a manner that promotes environmental ethics. The lack of efforts by the government to integrate environmental ethics into the school curriculum exposes our environment to harm, as little or nothing has been done to ensure the development of appropriate values in the way people relate to the environment. The following questions guided this study:

- How do South African teachers integrate environmental ethics education into their lessons?
- What is the level of teachers' awareness of environmental ethics education?

**Theoretical Framework.** Constructivism, a traditional educational theory, serves as the foundation of this paper. Constructivism theory places more emphasis on the learner than the subject matter being covered. One fundamental constraint of education is that learners must actively build information in their brains, and teachers cannot simply transmit knowledge to them (Bada & Olusegun, 2015). In other words, they (learners) gather and modify information, compare new and old information, and change rules when they are no longer applicable. According to Bada and Olusegun (2015), the learner is perceived as an active agent in acquiring knowledge. Constructivism theory is pertinent to this paper because it provides the authors with lenses to view how teachers involve learners when incorporating climate change into their lessons.

Constructivist learning theories were established by Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1980). Bednar, Cunningham, Duffy, and Perry (1992) and von Glasersfeld (2013) emphasize that learning objectives should be derived from real-world tasks with defined goals and that learning outcomes should rely on the knowledge production process. Similarly, von Glasersfeld (2013), Bada and Olusegun (2015) assert that learning is a process that involves self-regulation as well as the construction of conceptual frameworks through introspection and abstraction. In this context, it is crucial to note that constructivism can take many forms, with significant similarities and differences. Constructivism is a teaching and learning theory claiming knowledge is formed in the mind. In other words, learners build knowledge by fusing new and existing information. Constructivists believe that what learners learn is influenced by their viewpoints and attitudes and the context in which a topic is presented. Constructivism is a learning theory that describes how humans learn and acquire knowledge. As a result, it has an immediate effect on education. According to the thesis (Bada & Olusegun, 2015), people acquire knowledge and importance through their experiences.

**Literature Review. Environmental Education and Ethics: An overview.** Environmental education has been conceptualized in various ways by researchers and writers. Environmental education, according to Li (2018), Liu et al. (2019), and Monroe, Plate, Oxarart, Bowers, and Chaves (2019), is a process of cognitive value and concept clarification to develop, understand and appreciate skill and attitude necessary for a mutual relationship between humans, culture, and the creature and physical environment. It has been emphasized the need to incorporate environmental ethics into environmental education (Otto & Pensini, 2017). Recently, awareness campaigns on the relationship between humans and their immediate environment have intensified, but more needs to be done in environmental ethics education (Bonnett, 2019). The present paper aims to fill these gaps and deficiencies in the scientific literature. Considering the natural world from the humanities and social sciences perspective leads to critical moral judgments. Environmental issues, it is considered, can be better solved by introducing environmental ethics (Surmeli & Saka, 2013).

Research suggests that more attention should be given to the relationship between humans and the environment through education and enlightenment; humans should begin to see themselves as environmental stakeholders and equal to other stakeholders (Surmeli & Saka, 2013). Kronlid and Öhman (2013), it is essential to awaken and stimulate children's curiosity to learn the ethical values in their relationship with the environment. Environmental education aims to instill values of environmental ethics (as well as norms that are their mandatory counterparts). The pedagogical action and interaction between a teacher and a student that leads to acceptance of ecological values, increased environmental awareness, shaping attitudes, and ultimately creating man's ecological culture are thus referred to as ecological education. Eco-ethics (also known as environmental ethics) infuses ecological education with a set of principles and standards (Gola, 2017). To promote environmentally conscious conduct, environmental ethics, according to many academics, should be one of the essential elements of environmental education (Surmeli & Saka, 2013; Junges, 2016). By seeing the natural environment as our shared home, we can change our perspectives and take moral action. Linking scientific expertise with ethical knowledge, science, and ethics is essential. As a result, emphasizing the relevance of ethics in environmental education becomes vital (Junges, 2016). Furthermore, adults want the school to be where moral values are transmitted. The goal is to engage kids in a dialogue about moral principles, even if the values are vague and rebuttable, as in education for sustainable development (Gola, 2017).

One of the critical areas of environmental ethics is the need to point out the responsibility of humans to other creatures in the ecosystems. People must be sensitized to the great importance of

environmental ethics and the need to live in harmony with each other and their environment for sustainable development (Gola, 2017). The world is witnessing environmental crises like wildfires, flooding, landslides, drought, climate change, and other natural disasters reported daily. In South Africa, there was a massive flooding in some parts of Durban and acute water shortage in the Eastern Cape; these and other disasters are pointers to the need for a public consciousness to reexamine ourselves by creating values that will rekindle our ethical behavior to ecology and sensitized the younger ones on the importance of safeguarding our environment for sustainable development. Environmental ethics education is a veritable tool to create awareness of sustainable development, creating knowledge and skills required to solve various environmental problems. Also, it can enhance the development of cognitive, affective, and skill behavior that can enhance positive attitudes of humans in their environment, thereby capacitating them in solving environmental problems.

As moral wisdom, environmental ethics governs how humans interact with their environment (Washington & Maloney, 2020; Heruyono et al., 2021). Humans are at the core of the universal system in anthropocentrism ethics. Nature satisfies all human wants and has no monetary worth, allowing it to be abused in opposition to the biocentrism philosophy. Biocentrism regards nature as having value separate from human concerns. All living things have intrinsic worth and deserve to be respected. Biocentrism, according to Heruyono, Herdiansyah, and Putri (2021), is founded on the idea that people are part of the community life on Earth, that they and other species are interdependent, that all organisms are centers of life with goals, and that humans are not superior to other creatures.

**Integration of environmental ethics into the Classrooms.** Even though African educational institutions and governments progressively disregard African environmental ethics, they can contribute to human well-being and environmental sustainability (Zagonari, 2020). It is not, however, a panacea for all global environmental concerns, as it has limitations and must be improved. Environmental concerns necessitate multidisciplinary approaches and the cooperation of all nations Filho et al., (2015); African and other concerned scholars should thoroughly examine African environmental ethics to uncover the good qualities that will allow humanity to save Mother Earth and her inhabitants and achieve a sustainable environment.

The findings from the study reveal that, despite the numerous opportunities for teaching environmental ethics education in senior high schools, its effectiveness and resilience may be jeopardized by political, religious, sociocultural, and economic issues; and that the demand for proof and experimentation for many environmental ethics education perceptions and practices, as well as various forms of stigmatization, are significant challenges to be anticipated (Opoku & James, 2020). Morthy & Akwen (2020) believe that integrating value-based education into the teaching of environmental education will assist in solving environmental problems. Value-based education entails strategic ways of thinking about education that introduces learners to values that guide them in interacting with their environment. Inadequate professional development of teachers has pushed value-based education aside. In Geography class, learners can have the opportunity to learn and internalize the values of sharing, respect for the right of all, and responsibility to the environment (Morthy & Akwen, 2020). Promoting these strategies in the classroom will enhance learners' capacity to think and internalize them in their daily activities with their environment. Environmental ethics education can deepen and enhance learners' attitudes if teachers adopt value-based education in their teaching in the classroom. It is also important to note that value-based education can improve learners' capacity to discuss issues around solving environmental problems through appropriate attitudes and behavior of humans to their environment (ibid).

Preston (2011) believes that students benefit from teacher pedagogy that enables them to create their views and attitudes about environmental ethical formation. This assertion demonstrates the importance of appropriate strategies that can enhance the integration of environmental ethics into classroom teaching. Kronlid & Ohman (2012), in a study that is based on a critique that existing educational research does not reflect the variety of environmental and ethical theories, concludes the absence of teaching strategies focusing on the ethical concept of care, sympathy, compassion, gratitude, and friendship that can help teachers to teach environmental ethics education effectively. This position aligns with the views expressed by Mavuso, Khalo, Kafu-Quvane, and Olawumi (2022), which emphasized the importance of professional teacher development programs as a panacea to the solutions to environmental problems in South Africa. According to the authors, appropriate teaching strategies that Natural Sciences teachers can adopt in the classroom will enhance the teaching of the ethical aspect of environmental education.

There need to be appropriate strategies for teaching environmental ethics education to slow down the realization of the solutions to environmental problems affecting the world, particularly South Africa. Therefore, this study seeks to examine the literature to determine the level of implementation of teaching and learning of Environmental ethics education in the classroom.

**Level of awareness of environmental ethics education.** This position has been adjudged to be the best approach to solving various environmental problems. However, Liu et al. (2019); Heruyomo et al. (2021); Ceyhan & Sahin (2018); Tozan & Keles (2022) are of the view that teachers teaching environmental education need more appropriate awareness of the knowledge area. The need for more awareness of teachers could be because of the need for a teacher development program. It is important also to state that these teachers were not taught environmental ethics education in their preservice years. Hence, they need to gain appropriate awareness of the knowledge area. Universities should include environmental ethics education as part of the preservice teachers' program so that teachers will be aware of the ethical aspect of environmental education. Environmental ethics education awareness cuts across formal and non-formal education settings.

Heruyomo et al. (2021) believe that there must be synergy between the significant pillars of environmental ethics education. The pillar of unity of humans with nature can create an attitude of empathy and respect for nature. The pillar of ecological awareness of ecological nature and the pillar of the relationship of humans with the environment from the cultural point of view. These pillars can create awareness through teaching, training, and good habit, thereby promoting kindness and the spirit of sharing. Since knowledge dissemination increases awareness and promotes a positive attitude toward the environment, teachers' awareness should be intensified to enhance their capacity to teach environmental ethics in the classroom. In countries like South Africa, for instance, integration of environmental education was adjudged as a panacea to the solution to environmental education. Knowledge areas in environmental education must be incorporated into the textbooks to enhance the teaching of environmental ethics education in the classroom to solve lingering environmental problems like flooding, climate change, water shortages, etc.

The non-formal approach, like changing perceptions, behavior, concern, and community behavior, teaches cognitive awareness and helps internalize humans' positive behavior towards the environment. This is imperative because humans are part of the environment, and actions and inactions of humans will have positive and negative effects on the environment (Heruyono et al., 2021; Cooper, 2017). Alabas (2019), while corroborating this view, stressed that a lack of awareness of environmental ethics education was responsible for the inability of teachers to teach environmental ethics in their teaching in the classroom. Alabas (2019) noted that while

environmental education is being integrated into the Turkey's curriculum and textbooks, knowledge areas that will create empathy from the students must be adequately integrated. This indicates that awareness of environmental ethics education is essential for addressing environmental problems affecting the world, South Africa inclusive.

## METHODS

**Design.** The research approach used for this study was qualitative research design (Creswell, 2009; Maxwell, 2022; Lewis, 2015). The study adopts a systematic literature review in selecting articles for review. This approach ensures a systematic, transparent, and reproductive way of analyzing literature (Heyeres et al., 2019). This study aims to build a qualitative synthesis of the main points about teaching and learning environmental ethics education. To achieve the purpose of this research study and answer the research question, a thematic exploration of the literature was undertaken and identified the study's objectives. The study also explores emerging issues within the field of study.

**Participants/Samples.** 26 international journals were selected for the study. Scopus indexed 8 (30%) articles, and the other 18(69%) were indexed by other institutions. 8 Scopus-indexed articles (30%) are divided into quartile (Q1), quartile (Q2), Quartile (Q3). Q1 consists of 5 articles (19%); Q2 consists of 2 articles (8%); and Q3 consists of 1 article (4%). Copernicus, EBSCO, Mendeley, ERIC, Google Scholar, etc., indexed other 18 articles (69%). The result of the paper selected for review can be seen in Table 1.

**Table 1.** The Result of Journals Searched for Review.

S/N	Name of Journal	Total Articles	Year	Index by
1	Environmental Education Research	1	2013	Scopus (Q1)
2	The Electronic Library1	1	2019	SSCI
3	Ethics and Education	1	2017	Scopus (Q1)
4	Advances in Health Sciences Education	1	2009	Scopus (Q1)
5	Journal of Experiential Education	1	2012	Google Scholar
6	Journal of Cleaner Production	1	2016	Mendeley, Science Direct
7	Education Sciences	1	2018	Scopus (Q2)
8	International Journal of Educational Methodology	1	2022	Copernicus
9	Eurasia Journal of Mathematics, Science, and Technology	1	2018	Scopus (Q2)
10	Bangladesh Journal of Bioethics	1	2020	
11	Resources, Conservation, and Recycling	1	2021	EBSCO
12	South African Journal of Environmental Education	1	2022	DOAJ
13	International Electronic Journal of Environmental Education	3	2019, 2019 & 2017	ERIC
14	American Journal of Humanities and Social Sciences Research	1	2019	Google Scholar
15	Sustainability	1	2021	EBSCO, DOAJ

16	Science Insight Education Frontier	1	2022	EBSCO, ERIC, Google Scholar Copernicus
17	Journal of Philosophy of Education Environment, Development, and Sustainability	1	2004	EBSCO, ERIC
18	Sustainable Development	1	2010	Scopus (Q1)
19	Asia-Pacific Journal of Teacher Education	1	2014	EBSCO
20	Journal of Curriculum and Teaching	1	2011	Scopus (Q1)
21	International Journal of Contemporary Education Research	1	2021	ERIC
22	Educational Sciences Theory & Practice	1	2020	Copernicus, n ERIC, DOAJ
23	Eurasia Journal of Educational Research	1	2011	EBSCO, ERIC
24		1	2017	Scopus (Q3)
Total		26		

**Data Collection. Inclusion and exclusion criteria.** Selection of articles for this study was undertaken, taking into consideration of different criteria. The criteria are listed below:

- All literature was selected through Academic Search Complete (EBSCO), Scopus, and google scholar.
- The articles selected speak to environmental ethics education.
- Conference proceedings and other documents not published in article format were excluded from the selection process. Therefore, books, book chapters, conference proceedings, and contributions were excluded from the selection process.
- All articles selected were published between 2010 - 2022.
- Only peer-reviewed articles were considered for selection.
- Studies on environmental ethics education field.
- Articles whose topics speak to research questions were selected.

**Data Analysis**

**Table 2.** Distribution of results based on the level of awareness of teachers and students of environmental ethics education.

S/N	Study	Research Approach	No. of Participants	Result
1	Liu et al. (2019)	Qualitative research	360 University Students	Virtual reality experience and operation courses significantly increase people's interest, deepen the learning picture, increase learners' awareness, and promote environmental ethics and action experience.
2	Heruyomo et al (2021)	Qualitative research	Eco-environment	Environmental ethics internalization as a moral foundation among the people substantially improve awareness of human to interact with their environment. Human ethical awareness of their environment improves.
3	Ceyhan & Sahin (2018)	Mixed method	239 sciences and classroom teachers	Teachers have a high level of ethical sensitization to technology and environmental issues, habitat preservation, awareness of the environment, the use of genetic technology, and the development of moral awareness in pupils.

4	Hanifah et al. (2022)	Qualitative	180 secondary school students	Teachers' pedagogical practice in environmental ethics education significantly impacts the teacher-student relationships and their level of awareness.
5	Ndzimbomvu et al (2021)	Quantitative	32 learners (16 grades 9 and 16 grade 11)	The study reveals substantial differences between grade 9 and 11 learners in the learning content and the degree to which environmental education was taught.
6	Tozan & Keles (2022)	Quantitative	723 students (374 seventh grade and 374 eighth grade)	The findings from the study reveal that grade 7 <sup>th</sup> and eighth learners' awareness of environmental ethics education is greatly influenced by grade level, school location, and gender.
7	Ongon et al. (2021).	Quantitative	Eighty-nine first-year environmental education students.	The findings show that undergraduate students with varying grade point averages who participated in community-based environmental ethics education improved significantly in terms of environmental knowledge, environmental ethics, and environmental volunteers. Regarding gender, the results show that science teachers have statistically significant environmental awareness. Female science teachers had much higher environmental ethics awareness in biology than their male counterparts. This is also true of educational institutions.
8	Karakaya & Yilmaz (2017)	Quantitative	237 people (130 science & 107 Biology teachers)	The findings indicate that teacher candidates' environmental ethics education awareness was higher than average.
9	Guricin & Servinc (2017)	Quantitative	Quantitative	

Table 2 above indicates a low awareness level of teachers and students teaching environmental ethics education. The analysis also reveals that the need for more awareness of teachers teaching environmental education was responsible for the poor attitudes of students to their environment. While some teachers experienced a high level of awareness, others experienced a low level of environmental ethics education. The analysis also indicates that preservice teachers' awareness of environmental ethics education has nothing to do with their academic achievement.

**Table 3.** Distribution of Results Based on the Level of Integration of Environmental Ethics Education Into the Curriculum

S/N	Study	Research Approach	No. of Participants	Result
10	Gola (2017)	Qualitative research (Book analysis)	Grade 4 elementary school teachers	The findings suggest that (moderate) anthropocentric ethics predominate in the context of formal environments, while biocentric ethics is less common. Some emphasis on holistic ethics and the proclamation that humanity is a part of the environment also exists.

11	Garalnik et al (2012)	Qualitative (Observation Cross section)	Students and learning environment.	Integrating emotion into environmental ethics education will enhance the positive relationship between humans and the environment.
12	Baran et al. (2016).	Qualitative (Book analysis)	A book recommended by WAEC for Hausa Literature)	According to the report, during an overarching local and global sustainability problem, intergovernmental and national agencies (including civil society organizations) should consider employing environmental ethics to develop long-term transformative routes to sustainability.
13	Damoah & Adu (2019)	Qualitative	Six teachers	The findings reveal that teachers need to integrate environmental education into their teaching and need clear policy guidelines to be followed by teachers.
14	Alabas (2019)	Qualitative	Textbooks of lectures on morality course including environmental topics.	Findings reveal that environmental education was incorporated into the Turkey's curriculum and textbooks in the early 20 <sup>th</sup> century. Accordingly, knowledge areas that create student empathy must be adequately incorporated into the textbooks and curriculum.
15	Latin Simsek (2011)	Qualitative	Grade 6 <sup>th</sup> , seventh, and eighth science and technology curriculum.	Environmental education topics were generally explained through the selection of content from nature. However, environmental ethics and aesthetics should have been mentioned more.

The analysis indicates a need for a clear-cut strategy for teaching environmental ethics education from the literature analyzed. Teachers need to integrate environmental ethics education into their teaching because appropriate content for teaching environmental ethics education was not integrated into the textbooks and the curriculum. Several studies have advocated the development of appropriate strategies for integrating environmental education into the school curriculum; this can be seen in Table 4.

**Table 4.** Distribution of Results Based on Strategies for Teaching Environmental Ethics Education.

S/N	Study	Research Approach	Study population	Result
16	Liu et al. (2018)	Qualitative	30 Key books & 20 Key Articles	Virtual reality and operation courses could quickly pique learners' curiosity, enhance their learning image, and develop ethical behaviors and action experiences.
17	Morthy & Akwen (2020)	Qualitative	Some people and the environment	The role of value-based education in school curricula has been generally overlooked or even ignored.
18	Preston (2011)	Qualitative	Eight university teacher education students undergoing graduate certificate or diploma of outdoor	The study reveals that students benefit from teacher pedagogy that enables them to create their views and attitudes about environmental and ethical formation.

			and environmental education at Victoria University in Australia	
19	Karaham & Roehrig (2017)	Qualitative	Science and social studies teachers (2 teachers)	The findings indicate that both participants (Social et al. teachers) criticized the science curriculum for being unable to address every dimension of socio-scientific issues.
20	Kronlid & Ohman (2012)	Qualitative	30 Key books & 20 Key Articles	The study reveals the need for teaching strategies focusing on ethical concepts of care, sympathy, compassion, gratitude, and friendship that can help educators effectively teach environmental ethics education in the classroom.

Table 4 shows a need for appropriate strategies for teaching environmental ethics education. Some researchers have advocated different strategies (virtual-reality, value-based) for teaching environmental ethics education; however, teachers criticized the science curriculum because it failed to address socio-scientific issues. Appropriate teaching pedagogy will go a long way in assisting in teaching and learning environmental ethics education in the classroom.

**Table 5.** Distribution of Results Based on the Attitude of Teachers and Students to Environmental Ethics Education.

S/N	Study	Research Approach	No. of Participants	Result
21	Akhtar et al. (2021)	Quantitative (Survey Questionnaire)	7 Towns with a population of 7.2 million in Malaysia	Consumer environmental ethics, moral obligation, and green attitudes influence consumer green consumption.
22	Bhurekeni (2022)	Qualitative	Grade 3 students	The findings reveal that children associated their tokens and connected taboos to protect against environmental education and minimize resource over-extraction.
23	Yalmanci & Gozum (2019)	Qualitative	High school students	The study indicates a relevant association between ethical and environmental approaches that affect views toward the environment - ecocentric ethics, ecofeminist ethics, and theocentric ethics - but not with the anthropocentric ethics approach.

The findings show that environmental ethics education positively impacts humans' environmental attitudes. The analysis indicates that students' positive attitudes toward their environment from their cultural orientation can solve environmental problems.

## RESULT AND DISCUSSION

This study aims to systematically review the literature on the level of implementation of environmental ethics education by teachers in their classrooms teaching in the wake of environmental problems affecting the world. Environmental ethics education has become a veritable instrument for solving various environmental problems. In South Africa, subject-by-subject environmental education teaching and learning have been integrated into the school curriculum.

According to the findings from Table 2, teachers teaching environmental education need more awareness of the ethical aspect of environmental education partly because the module was outside their preservice teacher training or lack of teacher professional development. The low level of awareness of teachers on environmental education affected the teaching of environmental ethics in their teaching in the classroom. This indicates that teachers need more pedagogy and content for teaching the knowledge area. This position was also corroborated by Liu et al. (2019); Heruyomo et al. (2021); Ceyhan & Sahin (2018); Tozan & Keles (2022) when they assert that teachers teaching environmental ethics education lack appropriate awareness and hence, do not teach environmental ethics in their classroom. This position also aligned with the pedagogical content knowledge theory underpinning this study. It also emerged from the findings that teachers could not use a clear strategy to teach environmental ethics in the classroom. This position was also supported by literature by Morthy & Akwen (2020), positing the absence of a specific strategy that can be adopted in teaching environmental ethics education. The author recommends value-based education, which can assist learners in learning and internalizing the values of sharing, respect for the right of all, and responsibility to the environment. The findings also indicate a low integration of environmental ethics education in the classroom due to the poor awareness of teachers teaching environmental education. This position aligns with the view expressed by (Alabas, 2019). Teachers must be aware of environmental ethics education and integrate it into their classroom teaching. This situation was responsible for the poor attitudes of learners to the environment. The review articles reveal that when learners undergo knowledge development in their brains, teachers cannot simply transmit knowledge to them in line with the constructivism theory (Bada & Olusegun, 2015). According to Bada and Olusegun (2015), the learner is perceived as an active agent in acquiring knowledge. Constructivism theory is pertinent to this paper because it provides the authors with lenses to view how teachers involve learners when incorporating climate change into their lessons. This theory has provided an insight that knowledge of environmental ethics can be created in the mind. This implies that learners can acquire knowledge by integrating environmental ethics education, thus increasing their existing knowledge. Constructivists believe that learners' views and attitudes and the context in which a concept is presented impact what they learn. Also, teachers must utilize relevant content knowledge like ethics of care for the environment, empathy, respect for nature, and the ethical responsibilities of humans to the environment and demonstrate effective pedagogy that will facilitate the teaching of the content. The literature shows that environmental ethics education was separate from the preservice teacher's education; practicing teachers needed to be made aware of strategies they could adopt in the classroom. Literature also suggests that to close this gap, teachers must undergo a professional development program that will expose them to effective strategies they can use in the classroom. Research in teaching strategies for environmental ethics education must be stimulated so that teachers will be capacitated to teach environmental ethics education in the classroom.

## CONCLUSION

The findings from the literature systematic review reveal that teachers teaching environmental ethics need a more appropriate awareness of environmental ethics. Therefore, they were not teaching environmental ethics in the classroom. This scenario was responsible for learners' poor attitudes to their environment because they lacked an appropriate ethical code of conduct to facilitate a positive relationship with their environment. The findings also reveal the need for teachers to undergo a professional development program since environmental ethics education was not part of the teacher education program. The paper concludes that teachers teaching

environmental ethics education need more training in selecting content and pedagogy to teach environmental ethics education in the classroom. Therefore, the paper recommends organizing an ethical awareness training program by the Department of Basic Education for in-service teachers to expose learners to ethical and disciplined behavior in their environment. Research on strategies for teaching environmental ethics education must also be intensified for both preservice and in-service teachers. These strategies can also be incorporated into the preservice teacher education program.

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